Missouri Department of Natural Resources

Beneficial Use of Petroleum Contaminated Soil

Hazardous Waste Program and Solid Waste Management Program Technical Bulletin 2/2006

The Missouri Department of Natural Resources authorizes the beneficial use of Petroleum Contaminated Soil (PCS) as fill material under the conditions listed below. The conditions are an integral part of the department's authorization. The terms and conditions of this authorization are based on the requirements of the Missouri Solid Waste Management Law, the Missouri Clean Water Law and the Missouri Hazardous Waste Law. This authorization pertains to the use of the specified materials pursuant to these statutes. For the purposes of this authorization, PCS includes only soil affected by virgin petroleum products. It does not include soil contaminated with used oil.

The beneficial use of PCS as fill material is authorized subject to the following conditions. These conditions are an integral part of this authorization.

Conditions

1. Under this authorization, PCS may be used as a direct replacement or substitute for other fill materials.

2. Contaminated soils that are determined to be a listed or characteristic hazardous waste shall be managed as hazardous waste and are excluded from this beneficial use authorization. Information related to hazardous waste characterization can be found on the department's Web site at www.dnr.mo.gov/pubs/pubs.htm

3. The company or individual using or making the PCS available to others is ultimately responsible for ensuring the material is used in a manner that will not result in pollution, a public nuisance, or a health hazard. That same company or individual is also responsible for providing notification of the terms and conditions of this authorization, as well as a copy of the *Guidance to End Users for the Use of Petroleum Contaminated Soil as Fill Material* (see page 3), to any individual or company obtaining this material from them. The company or individual making the PCS available must also provide copies of any applicable correspondence or results of laboratory analyses to any individual or company obtaining this material from them.

4. This approval authorizes the use of PCS within the limitations given in the tables included with this technical bulletin. The table lists three categories of fill material and the conditions that must be met for each category. The company or individual using or making the PCS available is responsible for ensuring that these conditions are met, including obtaining results of analytical testing that has been performed on representative samples of the PCS to verify that the allowable concentrations are not exceeded. Although test results do not have to be submitted to the department for approval, records must be available for review by department personnel upon request.

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Category	Petroleum Contaminant Concentration	Allowable Uses	Nuisance Limitations
1. Clean Fill	No detectable petroleum contamination	Unlimited use	None
2. Minimal Contamination	Below Missouri Risk Based Corrective Action (MRBCA) Default Target Levels for Petroleum Constituents*	PCS may be used as fill material without further approval of the department. The PCS may not be placed in contact with groundwater or surface water and must be capped with at least one foot of clean fill material, or with at least 2 inches of asphalt or concrete.	Although not a human health risk, the soil may exhibit odor, staining, oiliness or other characteristics that the end-user may find aesthetically objectionable (i.e., a nuisance). Not recommended for fill around homes, gardens, play areas or other areas where there may be a high aesthetic consideration.
3. Moderate Contamination	Greater than MRBCA Default Target Levels for Petroleum Constituents*	Beneficial use allowed with a written site-specific approval by the department's Solid Waste Management Program. This requires the submittal of a proposal addressing the regulatory requirements of 10 CSR 80-2.020(9)(B), as outlined in the *Beneficial Use Guidelines* (see page 3).	See above.

* See Table 3-1, Default Target Levels

Notes:

1. Clean fill is defined in 260.200(4) as “uncontaminated” soil, rock, sand, etc. For purposes of this policy, clean fill means material with non-detectable levels of non-naturally-occurring chemicals.
2. Levels of naturally occurring metals in PCS shall be at or below their respective DTLs unless the levels can be shown to be representative of naturally occurring background concentrations.
3. No free product may be present in any material intended for use as PCS.
4. Default Target Levels are found in Table 3-1* of the *Missouri Risk Based (MRBCA) Process for Petroleum Storage Tanks**. A copy of the most recent version of this table is attached. Any revisions made to this table subsequent to the date of this bulletin shall become applicable to this approval.
5. Testing shall conform to MRBCA approved methods. Method detection limits must be sufficiently low (i.e., below DTLs) to demonstrate compliance with applicable standards.

* Table 3.1 and the *MRBCA Guidance Document* are also available on the Web at www.dnr.mo.gov/env/hwp/tanks/tanks.htm.

This authorization shall not be construed as compliance with any existing federal or state laws other than Missouri’s Solid Waste Management Law, Clean Water Law and Hazardous Waste Law, nor is this authorization be construed as a waiver of any other regulatory requirements. This authorization is not to be construed as compliance with any existing local permitting or zoning ordinances, nor does it supersede any local permitting and/or zoning requirements.

The department reserves the right to revoke, suspend or modify this authorization after due notice should the company or individual using PCS or making PCS available to others fail to comply with the terms and conditions of this authorization. The department expressly reserves the right to require appropriate corrective action if pollution, a public nuisance or a health hazard is created through the use of PCS.

Questions concerning this authorization should be directed to the department's Solid Waste Management Program at 1-800-361-4827 or (573) 526-3940 or in writing to P.O. Box 176, Jefferson City, MO 65102-0176. Thank you for your interest in protecting Missouri's natural resources.

The directors of the department's Hazardous Waste Program, Solid Waste Program and Water Protection Program approved this policy.

Attachments: *Table 3-1, Default Target Levels*
Guidance to End Users for the Beneficial Use of Petroleum-Contaminated Soil

For More Information
Missouri Department of Natural Resources
Solid Waste Management Program
P.O. Box 176
Jefferson City, MO 65102-0176
1-800-361-4827 or (573) 751-5401 office
(573) 526-3902 fax
www.dnr.mo.gov/env/swmp

Table 3-1 Default Target Levels				
Chemicals of Concern	**Soil (mg/kg)**		**Groundwater (mg/L)**	
Benzene	5.61E-02	Gwp	5.00E-03	Ing
Toluene	2.98E+01	Gwp	1.00E+00	Ing
Ethyl benzene	3.99E+01	Gwp	7.00E-01	Ing
Xylenes (mixed)	1.70E+02	Inh	1.00E+01	Ing
Ethylene Dibromide (EDB)	4.73E-04	Gwp	5.00E-05	Ing
Ethylene Dichloride (EDC)	6.31E-03	Gwp	1.56E-03	Ing
Methyl-tert-butyl-ether (MTBE)	4.53E-01	Gwp	1.46E-01	Ing
Acenaphthene	2.09E+02	Gwp	1.98E-01	Ing
Anthracene	3.14E+03	DC	9.89E-01	Ing
Benzo(a)anthracene	1.84E+00	DC	9.21E-04	Ing
Benzo(a)pyrene	1.90E-01	DC	2.00E-04	Ing
Benzo(b)fluoranthene	1.84E+00	DC	9.21E-04	Ing
Benzo(k)fluoranthene	1.84E+01	DC	9.21E-03	Ing
Chrysene	1.83E+02	DC	9.21E-02	Ing
Dibenzo(a,h)anthracene	1.84E-01	DC	9.21E-05	Ing
Fluoranthene	1.19E+03	DC	6.26E-01	Ing
Fluorene	2.71E+02	Gwp	1.32E-01	Ing
Naphthalene	1.06E+00	Gwp	3.55E-03	Ing
Pyrene	7.51E+02	DC	4.69E-01	Ing
TPH-GRO	3.83E+02	Inh	1.80E+01	Ing
TPH-DRO	4.14E+03	Inh	3.43E+01	Ing
TPH-ORO	5.08E+04	DC	3.18E+01	Ing
>C6-C8 (Aliphatics)	2.51E+02	Inh	9.86E+00	Inh
>C8-C10 (Aliphatics)	5.16E+01	Inh	3.35E-01	Inh
>C10-C12 (Aliphatics)	2.56E+02	Inh	2.24E-01	Inh
>C12-C16 (Aliphatics)	1.17E+03	Inh	5.16E-02	Inh
>C16-C21 (Aliphatics)	5.02E+04	DC	3.13E+01	Ing
>C21-C35 (Aliphatics)	5.02E+04	DC	3.13E+01	Ing
>C8-C10 (Aromatics)	4.13E+01	Gwp	1.73E-01	Ing
>C10-C12 (Aromatics)	6.49E+01	Gwp	1.73E-01	Ing

>C12-C16 (Aromatics)	1.29E+02	Gwp	1.73E-01	Ing
>C16-C21 (Aromatics)	6.25E+02	DC	4.69E-01	Ing
>C21-C35 (Aromatics)	6.25E+02	DC	4.69E-01	Ing
Tertiary-amyl-methyl-ether (TAME)	5.11E+00	Gwp	6.26E-01	Ing
Tertiary-butyl-alcohol (TBA)	5.63E-01	Gwp	2.86E-01	Ing
Ethyl-tert-butyl-ether (ETBE)	1.10E-01	Gwp	1.50E-02	Ing
Diisopropyl ether (DIPE)	7.96E+00	Gwp	6.77E-01	Ing
Ethanol	3.39E+00	Gwp	5.16E+02	Ing
Methanol	7.92E-01	Gwp	7.82E+00	Ing
Arsenic	4.35E+00	DC	1.00E-02	Ing
Barium	5.47E+02	Gwp	2.00E+00	Ing
Cadmium	1.88E+00	Gwp	5.00E-03	Ing
Chromium III	6.65E+04	DC	2.35E+01	Ing
Chromium VI	2.22E+01	Gwp	4.69E-02	Ing
Lead	2.60E+02	DC	1.50E-02	Ing
Selenium	4.37E+00	Gwp	7.82E-02	Ing

Notes:
DC: Direct contact pathway
Gwp: Protection of domestic groundwater use pathway (leaching)
Inh: Vapors from soil or groundwater to indoor air pathway
Ing: Groundwater ingestion pathway (i.e., domestic use)

Guidance to End Users for the Beneficial Use of Petroleum Contaminated Soil

When managed properly, petroleum-contaminated soil (PCS) may be used in many construction applications as a direct replacement or substitute for other fill materials. This document is intended to outline for the end user the basic guidelines for the beneficial use of PCS. Note that the Missouri Department of Natural Resources authorizes the use of PCS only in accordance with the conditions stipulated in the technical bulletin *Beneficial Use of Petroleum Contaminated Soil.*

Beneficial use of PCS carries with it certain responsibilities. As the end user, you must use common sense and good management practices to ensure the material will not create an aesthetic problem. Don't let your actions affect the quality of life of your friends and neighbors. Good management practices include:

- Incorporating the material into the fill site immediately or very shortly after hauling it to the site. Don't stockpile the material on site unless you cover it with a tarp or other protective covering;
- Avoiding placement of material on steep slopes where erosion is likely;
- Using up-slope storm water diversions and down-slope containment to prevent the material from washing off of your site onto your neighbor's property; and
- Preventing exposure to precipitation by ceasing activities when rainfall is anticipated.

Following these simple guidelines should ensure that you do not create a nuisance.

There are other responsibilities associated with the beneficial use of PCS as well. As the end user, you must make sure these responsibilities are met. They include:

- Notifying the landowner that PCS is being used and, if appropriate, marking property lines so that the material is not placed on someone else's property;
- Notifying city and county authorities such as planning and zoning and health departments that the beneficial use of PCS is to take place. Obtaining local approval for the use of PCS may be necessary;
- Notifying the appropriate district of the U.S. Army Corps of Engineers if the site is bordered by a waterway such as a steam or river, or if you will potentially impact a wetland;*
- Obtaining a land disturbance permit from the department's Water Protection Program if the total land area to be disturbed is one acre or larger in size.
- Ensuring that the PCS meets all specifications for the job site and that proper placement methods are used.

* These responsibilities apply regardless of whether you are using PCS or some other material.